

A member  
organization of  
[www.actua.ca](http://www.actua.ca)

actüa™

Learning for Change-  
Découvrir pour demain..



# GEERing Up!

## UBC Engineering & Science for Kids



# 2006 Final Report

# our mission and vision

For the past 11 years, GEERing Up! UBC Engineering and Science for Kids, a non-profitable student-run organization, has been promoting engineering, science and technology to children and youth across British Columbia. Affiliated with the Faculty of Applied Science at the University of British Columbia, we endeavor to reach as many youth as possible with our spring workshops and summer camps, with hopes to spark, intrigue, and inspire their interest in engineering and science. Furthermore, our programs are improved each year with more creative demonstrations, fun hands-on activities, and innovative projects. In the years to come, GEERing Up! will continue to reach more youth, regardless of gender, ethnicity, culture or socio-economic status, through the expansion of our existing programs as well as the introduction of new, exciting ones. Moreover, GEERing Up! is also pleased to provide a valuable and rewarding experience to its employees and volunteers to enrich the University community.



## a proud member of actua

GEERing Up! is a proud member of Actua, a national network of science and engineering camps. Actua is a charitable organization whose goal is to provide young Canadians with positive hands-on learning experiences in science, technology and engineering. Membership in Actua gives GEERing Up! the opportunity to access Actua's vast resource base and support through programs such as member funding (for programs such as girls' camps, Aboriginal Outreach and bursaries), training, national conferences, project development materials, and the opportunity to network with other Actua members. Please visit Actua's website at [www.actua.ca](http://www.actua.ca) for more information.

*It's been almost a month since camp is over, and our 7 year old son is still talking about the concepts he learned and explains everything to us!*

*- A Camper Parent*

*I feel more confident building my inventions these days!*

*- an Innovators Camper*

# a word from the co-directors

After an exciting and eventful four months together, summer has come to an end. As we wrap up GEERing Up!'s 11th year of success, it becomes even more evident how important and valuable GEERing Up! can be to the children and youth we have reached in the summer.

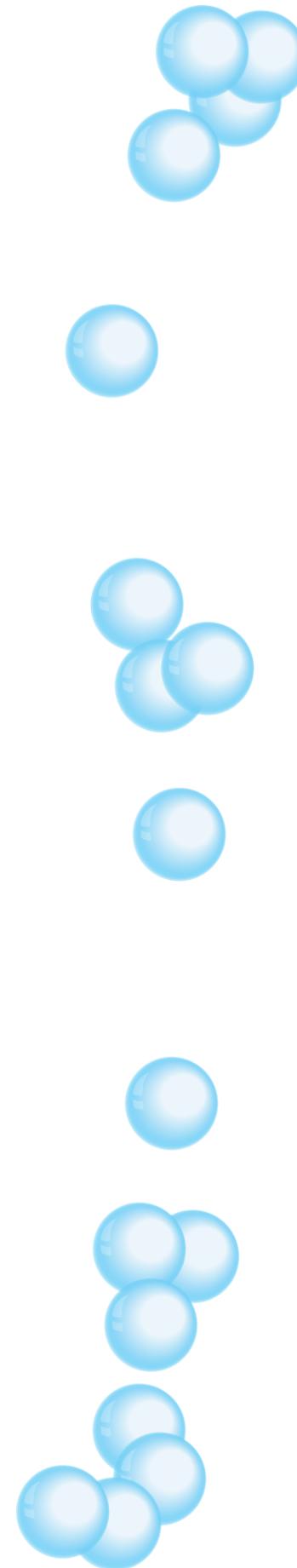
Through the use of interactive teaching methods and the accompaniment of a host of engaging questions, problem solving activities, and hands-on projects, we provide an environment that encourages youth to be more creative, innovative, and independent. We truly believe that this method is the best way for the children to come up with their own ideas, learn new concepts, and apply what they have learned in real life.

Here at GEERing Up!, we are always thrilled to receive positive feedbacks from teachers and parents. However, getting them directly from the kids is the biggest complement we can ever receive, and the most rewarding. Just by knowing that we made a difference in their lives is what drives us to continue promoting and growing the program.

GEERing Up!'s success would not have been possible without the dedicated and passionate individuals who were involved with this program, and we are extremely grateful for their hard work. Many thanks go out to the office staff in the Dean's office, the Engineering Student Service Center, and Mechanical Engineering for their support. We would also like to express our infinite thanks to our marvelous staff and incredible volunteers, who have spent countless hours planning, developing and delivering outstanding workshops and camp projects. Lastly, we would not have been able to deliver such a successful program without the support of our Sponsors. Our appreciation for everyone involved with GEERing Up! is immeasurable.

We are extremely proud of what GEERing Up! has accomplished over the past eleven years, and hope that we will continue to flourish in the future. We have been very fortunate and pleased to have been a part of this wonderful program, and we thank you all for sharing in this experience with us!

Sophie Ke and Diana Trang  
Co-Directors, 2006



# 2006 fiscal highlights

# budget breakdown

	Actual 2005	Projected 2006*	Budgeted 2007
<b>Revenue</b>			
Registration	92,042.00	89,390.00	127,760.00
Personal Donations	185.00	30.00	—
Industry Donations	23,025.00	18,825.00	6,025.00
Foundation Grants	1,500.00	—	—
University Donations	2,575.00	5,750.00	950.00
Federal Government – Wage Subsidies	6,080.00	4,480.00	4,160.00
Actua	5,755.00	7,107.24	5,950.00
Other	4,152.00	2,048.51	3,000.00
Previous Surplus	6,269.00	24,339.41	20,000.00
<b>Total Revenue</b>	<b>145,830.00</b>	<b>159,701.66</b>	<b>182,445.00</b>
<b>Expenses</b>			
Administrative	6,619.00	5,305.50	3,550.00
Advertising/Promotions	9,703.00	8,157.99	9,675.00
Project Materials	6,401.00	7,548.72	15,818.00
Transportation	1,689.00	669.83	3,633.00
Salaries and Training	79,576.00	73,105.01	95,656.75
Travel	3,824.00	2,349.44	5,390.00
Receptions	2,655.00	2,303.56	4,220.00
Special Programs	6,194.00	8,709.63	8,900.00
Other	583.00	37.52	1,000.00
Contingency Funds	24,339.00	20,282.96	20,000.00
University Endowment Funds	—	23,500.00	—
<b>Total Expenses</b>	<b>141,583.00</b>	<b>151,970.16</b>	<b>167,842.75</b>
<b>Revenue – Expense</b>	<b>4,247.00</b>	<b>7,731.50</b>	<b>14,602.25</b>
*Includes actual revenue and expenditures to October 5, 2006 and anticipated revenue and expenditures to December 31, 2006			

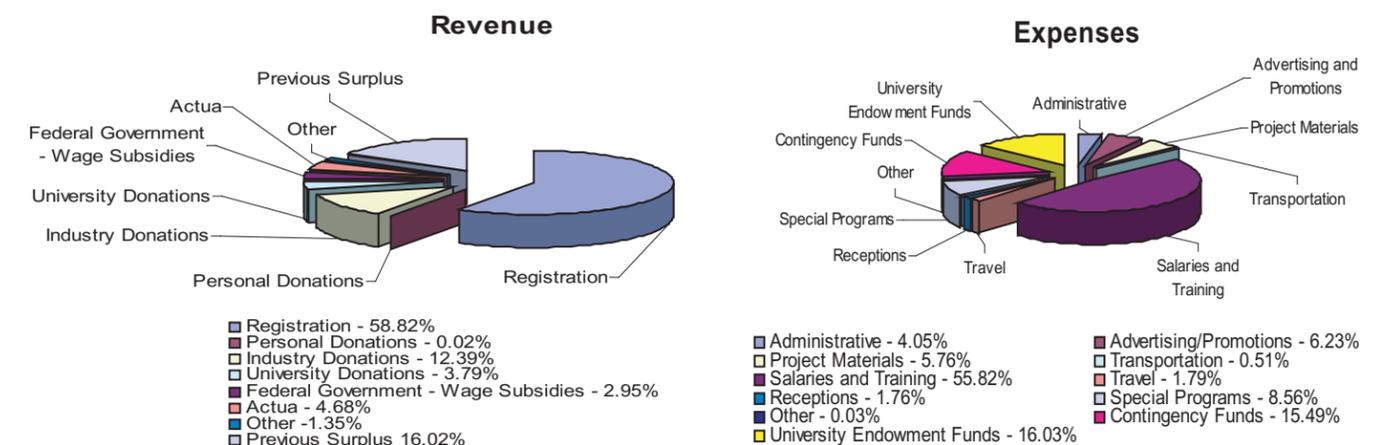
Overall revenue is up from 2005, which is a trend that started last year and will continue to grow as the program expands in 2007.

The registration revenue this year was down from last year due to a 24 to 25 campers cap compared to the usual 28. We felt that smaller classes would be more beneficial to both our campers and our instructors, as it would allow the instructors to spend more time with the campers. The decrease in revenue from Industry Donations and Foundation was expected due to the large one-time donations we saw in 2005. The decrease in Federal Government Wage Subsidies was due to a late application to the Science Faculty. Furthermore, the revenue from Other Income decreased because we hosted Friday Open House Pizza lunches instead of BBQs, which is not meant to be a source of income, but rather a chance for parents to bond with their kids, and see what GEERING Up! is all about.

On the other hand, University Donations and Funding from Actua is higher this year. This is due to a large amount donated by an on campus organization, and our participation in a new provincial program by Actua. On the expenses side, administrative and advertising expenses were lower than last year, as they had to create an online registration system, purchased a printer and two new computer monitors, and printed new brochures. The increase in Project materials is due to the purchase of ten sets of Lego Mindstorms for next year's camp. Salary expenses decreased because one of our four months instructors left midway, and we had to hire another two months instructor for just the camp portion of the summer. Travel expenses decreased as we only offered one Aboriginal Outreach Camp instead of last year's two. The Expenses for Special Programs are up due to the introduction of our brand new Technology Camp and the BC Hydro Power Smart activities.

In conclusion, we will be entering into the 2007 fiscal year with a surplus. This will stabilize the program and allow us to expand much further. Moreover, we will be offering a fourth camp each week. The budgeted increase in registration revenue is accounted for by these additional programs, which also corresponds to the increase in project materials, salaries and training expenses.

GEERING Up! has undergone substantial growth over the last few years, and is now primed to grow further. We have also planned to invest \$21,000 in the University Endowment Funds. This is due to the fact that GEERING Up! is a non-profitable organization, and at times it can be quite difficult to ensure a stable financial situation. This investment will serve as a backup and a reassurance to the University, which will allow GEERING Up! to use these funds in emergency situations. A contingency fund of 15.49 percent is also included in the 2006 budget.



# discover our history

When Dr. Ian Gartshore, then Associate Dean of the Faculty of Applied Science at the University of British Columbia, first approached a group of students about starting a non-profit group to introduce youth to the world of engineering back in 1995, he could never imagine what the idea could become. In eleven short years, GEERing Up! UBC Engineering & Science for Kids has become a dynamic and highly visible organization of dedicated undergraduate students with a vision of exposing every student in the province to the wonders of science, engineering and technology. Dr. Gartshore introduced the group of students to Actua (then known as YES (Youth Engineering and Science) Camps Canada), and the remarkable work that had begun at other institutions across our country. Excited by the possibilities, Ms. Christine Yeung and a group of other dedicated undergraduate volunteers started planning GEERing Up! UBC Engineering for Kids as part of their fourth year design project. Their goal was to show youth in the community that engineering was not just building bridges and driving trains, but a complex profession mixing science and theory with the real world in order to design and construct everything imaginable, from industrial chemical processes, to aircraft, to environmental models, to cities. In 1996, after securing a solid commitment from the Faculty of Applied Science, the students set out, offering in-class workshops to elementary schools in the Lower Mainland and engineering camps to youth during the summer. Both children and parents alike were receptive to the idea of learning about science and engineering through fun, hands-on projects, and the program flourished. In 1999, the program expanded by running additional camps in the summer and a high school camp program in the fall of 1999.

By the year 2000, the organizational structure of GEERing Up! had substantially evolved to accommodate the increasing number of youth being reached and the growing number of undergraduate students becoming involved in running the program. The year also marked the beginning of our Aboriginal Outreach and All-Girls initiatives, the next steps in our continuing commitment to reach out to children in areas traditionally underrepresented in science, engineering and technology fields.

As GEERing Up! continued to change and evolve, it became apparent that the focus of the program was not purely engineering as kids needed to learn the science basics before they could apply them, and so in 2002 the program changed its name to GEERing Up! UBC Engineering & Science For Kids. The year was also one of growth and market testing, which unfortunately left the summer of 2003 faced with financial difficulties. The program quickly rebounded from this setback, and has continued to grow, with more campers reached every summer since, and the debt was completely eliminated in 2004. 2004 also saw the restructuring and development of several programs, including the creation of the Junior Engineer Leadership Program (to replace the former volunteer program), and the retooled and renamed Young Women in Science, Engineering and Technology program (replacing a mentorship program retired several years prior). In 2005, the position of a Special Needs Integration Support Instructor was introduced to accommodate and help the campers with special needs.



11 undergraduate students hired  
23 high school and university volunteers  
over 2000 volunteer hours

2006:

by  
the  
numbers



may and june

5 communities  
19 schools  
144 workshops  
3506 students

july and august

483 campers  
41.8% female  
58.2% male  
9 with bursaries  
23 in aboriginal outreach

over 200 youth at community events

APEG-BC's E-Fest at Vancouver Public Library, Leisure Fair, UBC's Euclid Day, UBC Applied Science Open House, UBC Civil Engineering's Professional Night



# our programs

## junior engineering leadership program

Each year, GEERing Up! invites high school students in grades 11 and 12, as well as university students to become Junior Instructor Volunteers at our summer camp. This year, we had a total of twenty-three Junior Engineers, nine of which were returning volunteers.

The role of a Junior Engineer is very diverse and ranges from assisting the camp instructors in teaching camp projects, to organizing games at breaks. This year we incorporated a new component to their role: to present demonstrations at our Friday open house. The purpose of this addition was to give the volunteers more responsibility and ownership of their job, as well to establish a stronger bond between the volunteers themselves. Furthermore, the demonstrations allowed the Junior Engineers to showcase their personalities, talents, and knowledge of science and engineering in front of a crowd of campers and their parents. It was also very entertaining for everyone to see the demonstrations!

Our Junior Instructors are a very valuable part of our camp. All of the volunteers are required to attend a training retreat, where they are trained in issues and topics such as Dealing with Students with Exceptionalities, Taking Initiative, Leading Games, Teamwork, and Developing Leadership Skills. The goal of our Junior Engineer Leadership Program is to mentor students to develop leadership skills, communication skills, teamwork skills, and inspire and fuel their passion for engineering and science.

## workshops

In May and June this year, we again delivered in-school workshops to elementary schools across five different districts of Vancouver. Workshops were aimed at promoting engineering and science to youth at a young age in hopes of sparking interest and generating excitement for each discipline. This year, we delivered 144 workshops to 3506 students from grades K-7 in public schools, a Muslim School and a home school.

This year, the teachers have the option of choosing between three workshop topics, Excitable Energy, Mechanical Superheroes, and Wacky Wonders of the Human Body, all of which are available in a junior and senior version. Each workshop is approximately two hours in length and incorporates a host of demonstrations, activities, and a hands-on take-home project to aid in the learning of concepts and theories. Following each workshop, teachers are given a 'Teacher's Version' of the workshop which includes references and resources for future use, and a YES or KNOW Science Magazine.

## on campus summer camps

The other one of our two flagship programs is our on-campus summer camps, which operates in July and August. This year, GEERing Up! hosted 21 camps in 7 weeks for children and youth aged 6-16. We had 483 participants with 41.8% of the campers being girls and 58.2% boys. Our week-long program is completely developed by our instructors and covers various science and engineering topics such as: mechanical engineering, space, archeology and biology. Some of the highlights of this year's projects include Disillusion Maze, Starfinder, Banana DNA, Space Elevator, Human Spiderweb, Eguner Lander, and Archeological Dig.

In addition to our instructors, we also incorporated lab tours and special guest mentors into the camps. The tours and mentors allow campers to experience and understand how the theories they are learning are applied in real life situations, and learn about possible careers in engineering and science. This year, the campers had the opportunity to attend four tours: a Robotics Lab, the Pacific Museum of the Earth, the Mechanical Engineering Anaechoic Chamber, and the Faculty of Forestry tour. We also had three speakers coming from BC Hydro (one of which was the parent of a camper!), a UBC Engineering Professor, and a Pediatrician. We hope that these tours and mentors have helped to enrich our campers' GEERing Up! experience.

## community outreach

GEERing Up! participates in various Community Outreach events during the year. This year, we made slime and super-loopers at the APEG BC's E-Fest at the Vancouver Public Library, attended UBC's Applied Science and Civil Engineering's Open Houses, and hosted a Straw Tower Building Challenge for the Euclid Awards Ceremony Tour. Furthermore, we also reached out to children with special needs by attending the leisure fair hosted by the Development Disabilities Association.

Moving forward, we hope to participate in more community outreach events to promote our program to more parents and kids, and to get even more people interested in engineering and science. We want people to know that camps like GEERing Up! are available to young kids across Canada, and that science and engineering can be fun, exciting, and challenging!

## our instructors

We are thrilled to have hired eight amazing instructors this year, and loved the fact that they all came from different academic backgrounds. Four of them are from Mechanical Engineering, while the other five are from BioMedical Science, Computer Science, Biology, and Education. The diversity of their academic backgrounds provides more depth to the development of our workshops and camp curriculum. The creativity, dedication, and passion of our instructors was evident at workshops and camps everyday. We are very grateful to have assembled such a great team!

## special needs integrated instructor - snis

The Special Needs Integration Support Instructor position was first introduced in 2005, and due to its success, we would like to make it a permanent part of our program.

Our SNIS instructor this year, Jennifer, is extremely knowledgeable and experienced in dealing with special needs kids. She is currently a Special Education teacher at a couple of elementary schools. Prior to the start of camp, she provided us with a training session on Exceptionalities. These exceptionalities range from mild to severe and encompass exceptionalities anywhere from learning disabilities, to ESL, to Autism, to Asperger's, to physical disabilities. The training session helped us become more aware and have a better understanding of the various types of exceptionalities and what we can do to incorporate those kids into our camp effectively.

The SNIS instructor's main role is to help integrate youth with exceptionalities into our regular camp program. The SNIS instructor gives GEERing Up! confidence in our ability to deliver fun and exciting camps to all our campers regardless of ability. We also feel that our SNIS gives parents the peace of mind and confidence in sending their kids to our camp. Jennifer definitely exceeded our expectations and was great with the kids.

## girl's only! program

This year GEERing Up! offered two Girls Only! camps during the first week of camp for girls in Grade 2 to 6. The teaching materials and projects are very similar to regular co-ed camps, but are taught in a girls' only environment. This is due to the fact that studies have shown that girls are more likely to feel more comfortable in learning about engineering and science in an all-girls environment, which empowers them to explore their potential.

In the Girls Only! classes, we still maintain our one female and male instructor ratio to promote gender equality in engineering and science, as well as to dispel the perception of males being more dominant in these fields. We want our girls to know that they can be great scientists and engineers too!

## bursaries and free workshops

Each year, GEERing Up! offers bursaries to campers who are from socio-economically disadvantaged backgrounds. This year, with the help of Actua, we were able to provide a total of nine full bursaries. In the future, we would like to provide more bursaries and recruit more campers from socio-economically disadvantaged communities we have not yet reached.

In addition,, we were also able to offer again, free workshops to socio-economically disadvantaged schools. This year, we were able to present a day of free workshops and four days of subsidized workshops. Moving forward, we would like to continue this effort to promote engineering and science to kids who attend these socio-disadvantaged schools.

# special programs



## bc hydro power smart

This year, with the support from BC Hydro Power Smart, we taught the campers about energy saving and being "Power Smart". Moreover, they built their own solar ovens and wrote pledges on how they would be more energy efficient in their own lives on paper lightbulbs. In addition, we also had two Power Smart representatives come into our class every week to speak to all our kids about becoming more Power Smart. The representatives were very engaging and fun, and we thoroughly enjoyed having them as a part of our camp!



## technology camp

This year was the first time we offered a Technology Camp. This camp was targeted at students who are entering into grades 7-9, and were interested in gaining experience in various aspects of the field of technology. We were very encouraged by how quickly the camp filled up, and unfortunately had to turn away many other interested campers. Due to the popularity Tech camp experienced this year, we hope to offer an additional camp next year!

The development of projects for the Tech camp was overseen by one of our instructors, Henry, and he did a great job! Some of the projects that were developed include: Build Your Own Computer, Five Key Electric Piano, C++ Programming, Lego Mindstorm Robotics, and making animations using Macromedia Flash.

We already have visions for the future, as well as plans for further improvement. We hope to expand this program with more challenging and innovative projects in the years to come.

## yes mag literacy program

GEERing Up! is proud to continue to offer subscriptions to YES Mag, Canada's only science, engineering and technology magazine for kids, to our campers at a significant discount. One year subscriptions, normally \$22, are available at the camp for the cost of \$15. Additionally, YES Mag subscriptions are included in our full bursary packages and individual copies are provided to elementary school classrooms along with our workshops. YES Mag provides a valuable tie to the fun side of science year-round and promotes reading and independent investigation through experiments and projects.

## aboriginal outreach



This year, we returned to Comox for a week of Aboriginal Outreach in August. In previous years, all the campers were combined into one group and completed all the same activities. However, this year, we split the campers into two sessions: one for kids from ages 5-10, and one for kids from ages 11-16. This split allowed us to do more age-appropriate activities and to continually challenge them with more engaging activities. Some of the activities for the younger kids included: Disillusion Maze, Starfinder, Banana DNA, Elastic Car, Eguner Lander Solar Oven, and Paper Tunnel. Some of the activities we did with the older kids included: Space Elevators, Banana DNA, Electric Basketball, and Archeological Dig. We also brought both groups together on Friday to do some activities, as well as letting them teach us about topics they enjoyed in the afternoon. This was especially thrilling for us to see as you could feel the excitement from the kids when teaching and also because it showed a high level of understanding for the concepts taught in class.

We were able to reach 23 kids this year, and the experience was very rewarding for the three of us who went. The campers had great potential and were keen and eager to learn. It was extremely encouraging and exciting to see how excited and intrigued they were about science and engineering! Their comments about how fun the camp was, and how they could not wait to get out of bed in the morning to come to camp were amazing to hear! We wish them all the best, and hope that their experience with engineering and science continues far after we are gone!

Next year, we hope to return to Comox for another week of great fun. We also hope to reach at least one other community for Aboriginal Outreach. It is our passion to continue promoting hands-on engineering and science to kids who may not receive much exposure otherwise.

# thank you to our 2006 sponsors

## platinum

Telus  
BC Hydro  
Grad Class Act

## gold

APEG BC  
BC Hydro Power Smart  
British Columbia Transmission Corporation  
Government of Canada Summer Career Placement Program, with support from the UBC faculty of Applied Science  
The Pacific Museum of the Earth  
Weyerhaeuser

## actua national funders

NSERC  
Shell Canada Limited  
L'Oréal Canada  
Canadian Engineering Memorial Foundation

## bronze

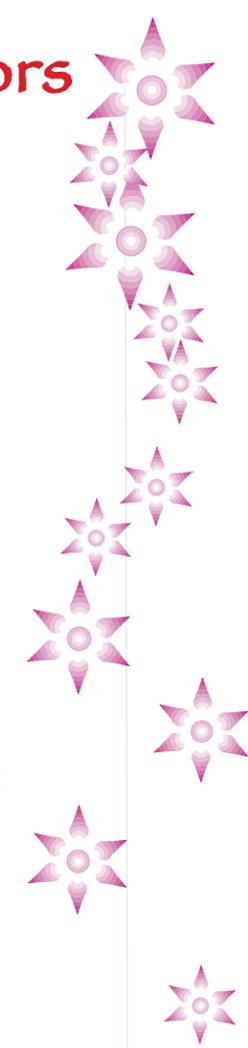
Flour Canada, Ltd.  
Mineral Resources  
Education Program of B.C  
SCIENCE WORLD  
UBC Department of Civil Engineering

## iron

UBC Department of Electrical Engineering

We would also like to thank the following individuals and organizations for their help and support this year:

Dr. Bruce Dunwoody, UBC Faculty of Applied Science, Peter Grant, Ellen Siu, Paul de Leon, Cheryl Kinkaid, Yuki Matsumura, UBC Engineering Student Service Center, Ruth Kwok, Robert Bacon, Susanne Milner, Ken Lador, Brian McMillan, Alan Steeves, UBC Department of Civil Engineering, Kate Thibert, Prof. Helmut Prion, UBC Department of Mechanical Engineering, UBC Classroom Services, UBC Custodial Services, Kishani Gibbons, Wendy Johnson, Denise Pearce, John Nakane, Joanna Mackie, Murray Hodgson, Mackenzie Parker, Dr. Elizabeth Croft, Dr. Karim Hirji, Dr. Winnie Siu, Actua National Office, and all of the other Actua camps.





*I loved the presentation!  
The kids were excited and full of energy for  
learning!*

*- Alison Diesvelt, Trudeau Elementary*

*It was fantastic! The students were totally  
engaged from beginning to end!*

*-Stacey Sveistrup, Mokeohnie Elementary*

*Thank you to the staff of 2006!  
It would not have been possible without you.*

*Co-Directors:*

*Diana Trang, Food Science/Dietetics  
Sophie Ke, Electrical Engineering*

*Head Instructor:*

*Kristy Wiens, Mechanical Engineering*

*Instructors:*

*Morgan Levell, Mechanical Engineering*

*Emily Morris, Biology*

*Henry Ng, Computer Science*

*Daryl Schubert, Mechanical Engineering*

*Garreth Thomas, Mechanical Engineering*

*Vanessa Tan, Kinesiology*

*Theresa Cummings, BioMedical Sciences*

*Special Needs Integration Support Worker*

*Jennifer Paszkat, Education*

GEERING Up! UBC Engineering & Science for Kids  
1100-2332 Main Mall, UBC, V6T 1Z4  
Tel: 604-822-2858 Fax: 604-822-2021  
Email: [geeringup@apsc.ubc.ca](mailto:geeringup@apsc.ubc.ca)  
Web: [www.geeringup.apsc.ubc.ca](http://www.geeringup.apsc.ubc.ca)

